PHASE I REPORT

STORM WATER MONITORING

Submitted to:

ANN BEHA ASSOCIATES, INC.

FOR

NATIONAL PARK SERVICE

SOUTHEAST REGION

Prepared by:

Law Engineering and Environmental Services, Inc.
Kennesaw, Georgia

January 1996
Project 55-3510

CHATTAHOOCHEE RIVER MODELING PROJECT

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1.0 INTRODUCTION

The Chattahoochee River between Buford Dam and the headwaters of West Point Lake (hereafter referred to as the study area) is one of the most important water resources in Georgia. The Environmental Protection Division, Georgia Department of Natural Resources, (GAEPD) is currently conducting the Chattahoochee River Model Project (CRMP) to evaluate the water quality of this River segment. The study area and watershed are shown in Figure 1.

This river segment supplies over 70 percent of the Atlanta metropolitan region drinking water, receives approximately 320 million gallons per day of treated wastewater, and provides both peaking hydroelectric power, as well as cooling water for conventional thermal power generation. The River is the focal point of the Chattahoochee River National Recreation Area, whose users fish in one of the southernmost trout fisheries in the United States, swim and raft, and enjoy the river's scenic and natural beauty (ARC, 1992).

Downstream from the study area, water users rely upon the River to satisfy their needs for drinking water, irrigation, assimilative capacity, navigation, recreation, and ecological protection. Competing demands and a rapidly expanding Atlanta region have made the Chattahoochee River and its management the focus of great interest.

GAEPD is responsible for implementing water quality standards in Georgia. GAEPD administers the National Pollutant Discharge Elimination System (NPDES) permitting program for the State. As water quality management issues in the study area become more complex, GAEPD recognizes the limitations of the steady-state water quality model they have used to support regulatory decisions for this river segment. Consequently, the CRMP will replace the State's outdated water quality model with a state-of-the-art dynamic computer model and data analysis tools. These advanced modeling and analysis tools are being designed to address the water quality and regulatory issues facing the Chattahoochee River study area well into the twenty-first century.

Prepared/Date: pdl 1993
Checked/Date: eab 01/11/96

National Park Service Atlanta, Georgia	LAW Engineering and Environmental Services	Chattahoochee River Modeling Project Study Area Project 55-3510 Figure 1

1.1 Project Study Area

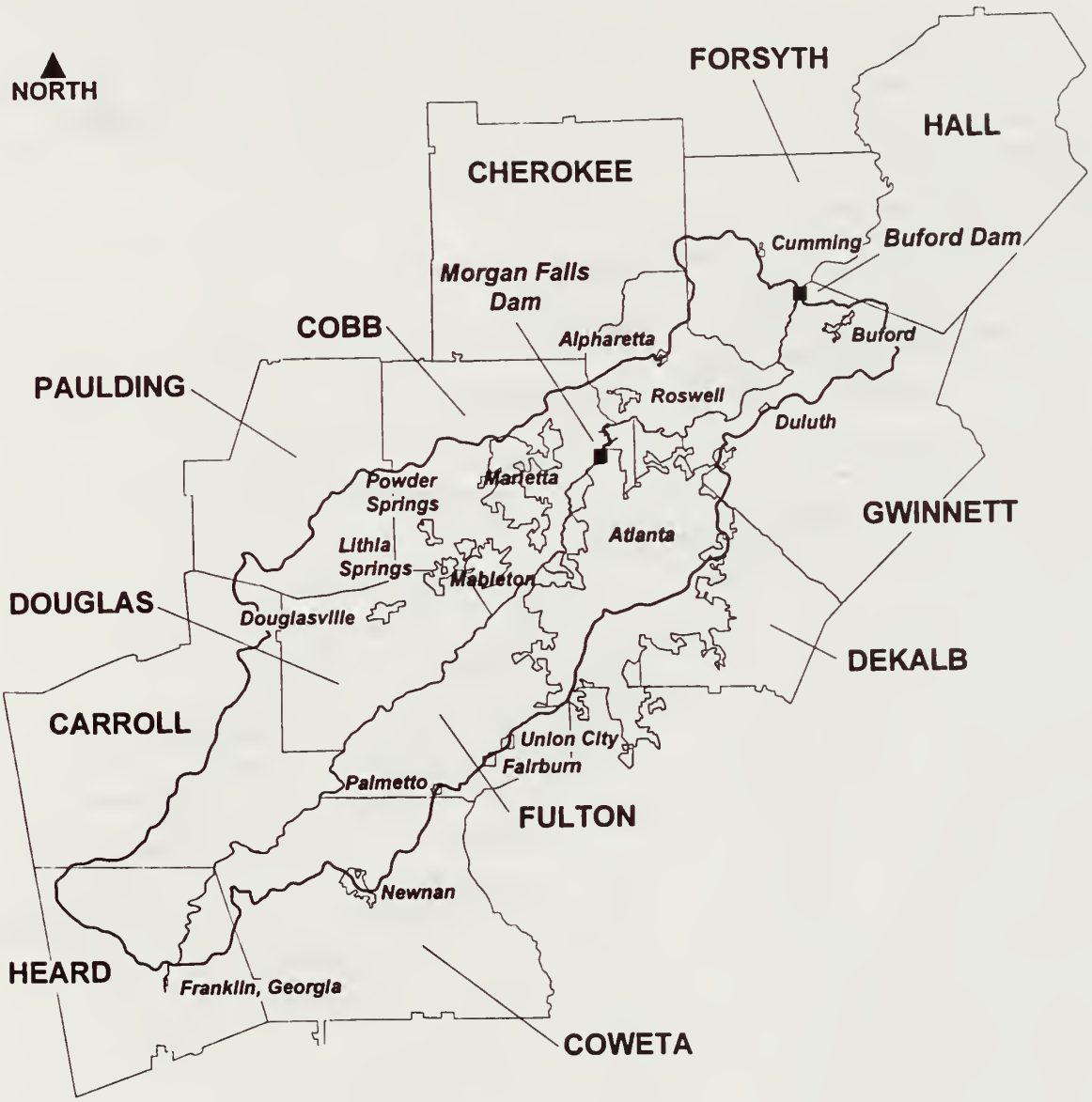
The headwaters of the Chattahoochee River are in the mountains of North Georgia. The River flows south and converges with the Flint River at Lake Seminole to form the Appalachicola River which flows to the Gulf of Mexico. The Chattahoochee River study area is 113 miles long with a watershed area of 1640 square miles. The study area watershed represents 19 percent of the entire Chattahoochee River Basin. The study area watershed includes portions of 12 Georgia counties; Carroll, Cherokee, Cobb, Coweta, Dekalb, Douglas, Forsyth, Fulton, Gwinnett, Hall, Heard, and Paulding. It encompasses numerous incorporated cities and towns, including the majority of Atlanta, the largest city in the Southeastern United States (see Figure 2).

Land use in the study area ranges from densely populated urban areas to rural agriculture to forests. Urban centers include Atlanta, Douglasville, Marietta, and scattered smaller urban centers. All are characterized by extensive residential communities connected to commercial, industrial, and transportation centers. Undeveloped forested and agricultural lands currently make up slightly more than 50 percent of the watershed between Buford Dam and Peachtree Creek. However, these lands continue to be converted to developed land for residences, office buildings, commercial establishments, and industrial facilities (ARC, 1992). Land use for tributary areas from the Peachtree Creek - Chattahoochee confluence downstream to the River's confluence with Sweetwater Creek is characterized by the dense urban, industrial, and residential development that extends outward from the City of Atlanta. Land use downstream from Sweetwater Creek toward Franklin, Georgia, becomes increasingly rural.

1.1.1 Tributaries

There are 47 tributaries to the Chattahoochee River with drainage areas greater than three square miles (see Figure 3). These tributaries account for 1,407 square miles, or 86 percent of the entire project watershed area. The remaining watershed consists of tributaries with areas less than three square miles that drain directly into the River.

Chattahoochee River flows are dominated by releases from Buford Dam during hydroelectric power generation. However, during non-generating periods tributary inflows account for an



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National Park Service Atlanta, Georgia	LAW Engineering and Environmental Services	Chattahoochee River Study Area Region Project 55-3510 Figure 2

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National Park Service
Atlanta, Georgia

LAW
Engineering and Environmental Services

Chattahoochee River
Tributary Watersheds

Project 55-3510 Figure 3

increasing percentage of the mainstem flow. Similarly, during stormwater runoff events tributary inflows contribute a higher percentage of the total flow in the Chattahoochee River. Some tributaries in the study area receive treated wastewater from permitted municipal and industrial facilities. In addition, land use within the tributary watersheds affects the water quality of tributary baseflows and stormwater runoff that reach the River. Therefore, both mainstem flow and water quality are affected by tributary inflows.

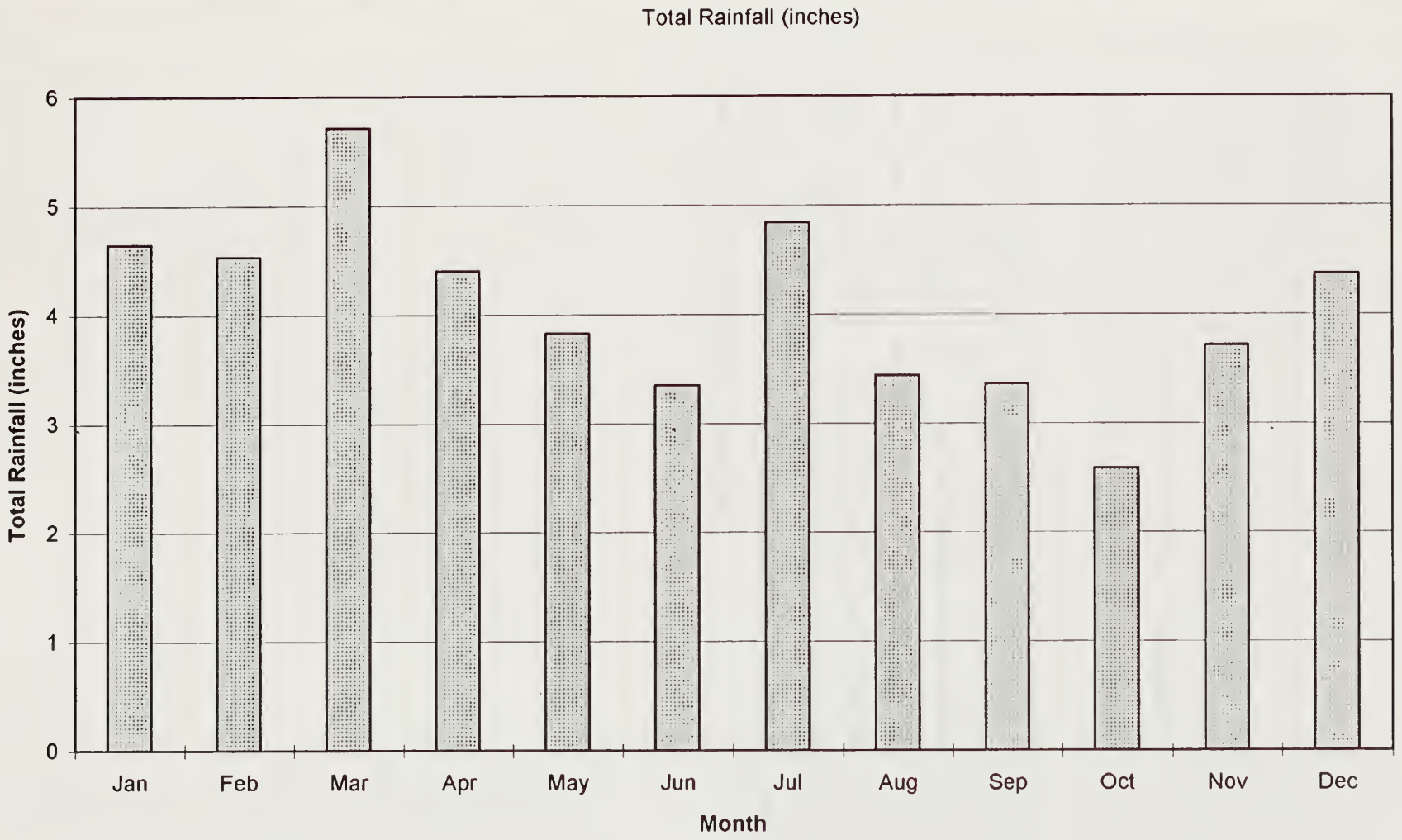
1.1.2 Climate

The study area climate is influenced by its proximity to the Gulf of Mexico, and to a lesser degree by the Blue Ridge Mountains to the northeast. Average annual precipitation in the study area exceeds 47 inches. As shown in Figure 4, most rainfall occurs in the winter and early spring months; during the summer, thunderstorms with short periods of intense rainfall are common (USGS, 1979a).

1.2 Purpose of the Stormwater Study

As discussed in the previous section, river flow and water quality are influenced by many factors including tributary inflows, treated wastewater discharges, thermal electric power plants, water supply intakes, and regulation at Buford and Morgan Falls Dams. In the last two decades attention has shifted from the adverse water quality impacts of point sources to those of non-point sources including stormwater. The most recent Water Quality in Georgia report (GAEPD, 1991) identified the primary cause of use impairment in the Chattahoochee River as non-point source pollution from urbanized areas. Nationwide studies in general have indicated that stormwater runoff from non-point sources may contain constituents in sufficient quantities to degrade water quality in receiving streams. A USGS study found that, on an average annual basis, non-point source discharges contributed approximately 85 percent of the dissolved solids load, 65 percent of the total phosphorus load, 65 percent of the total nitrogen load, 80 percent of the total organic carbon, and 90 percent of the total copper, lead, zinc, and arsenic loads at Whitesburg, Georgia (USGS, 1979b).

Since stormwater has been demonstrated to be an important component of the pollutant loadings to the Chattahoochee River, there is a real potential that the critical water quality conditions may



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National Park Service
Atlanta, Georgia

LAW
Engineering and Environmental Services

Atlanta's Monthly Rainfall

Project 55-3510

Figure 4

be associated with stormwaters. Therefore, methods for estimating those loadings are necessary to develop management strategies protective of the River's water quality.

The Chattahoochee River Model will assess the River's water quality for all conditions including the impacts from dynamic wet-weather conditions. The mainstem model is being designed so that is can simulate the water quality impacts of stormwater runoff from the tributary watersheds within the study area. To assist in this effort, the Chattahoochee River Stormwater Project was initiated to estimate the water quality characteristics of tributary stormwater runoff to the River mainstem and develop a strategy for applying these methods in the evaluation of management alternatives.

Thus, the objective of the Stormwater Project is to determine the tributary loading data to the mainstem River model. The Stormwater Project involves the collection of stormwater flow and water quality data, data analysis, and computer modeling to predict stormwater quantity and quality. The stormwater monitoring data will be used to calibrate and verify the EPA Storm Water Management Model (SWMM), which will in turn be used to calibrate and verify the mainstem model. The SWMM model will then be used to estimate pollution loadings to the mainstem model during the critical conditions analyses. In addition, the SWMM models can be used for future storm water management alternative evaluations.

2.0 STORMWATER SAMPLING

The tributary chosen for National Park Service study was Suwanee Creek. The National Park Service (NPS) has a desire and mandate to protect the Chattahoochee River National Recreation Area (CRNRA). Suwanee Creek drains portions of the CRNRA. As a result, the NPS selected Suwanee Creek to be studied by sampling runoff from storm water events. The data will be used to assist the NPS in managing the CRNRA and can be used to provide data for the CRMP.

On October 24, 1995, the Creek was instrumented with an ISCO automatic sampler, bubbler flow meter, and rain gage at the intersection of Buford Highway (Highway 23) and Suwanee Creek. The equipment was located upstream from Buford Highway, as close to the USGS gage as possible (see Figure 5). The equipment was installed in a concrete manhole such that it was readily accessible and minimized the potential for vandalism.

The bubbler and sampler tubing were enclosed in four-inch PVC pipe for protection. The bubbler tubing and intake strainer were located approximately eighteen inches off the channel bottom, approximately five feet from the right edge of water looking downstream, and perpendicular to the flow (see Figure 6). The bubbler rate was set at approximately one bubble per second, as recommended by the manufacturer.

The configuration of the automatic sampler was 24-1 liter clean polypropylene bottles. The sampler was programmed to activate and begin collecting storm water samples after a pre-selected water depth of 2.25 feet had been reached. A 4-liter grab sample was collected by the sampler twenty minutes after the equipment was activated. Up to five flow-weighted samples were collected over the duration of the storm event hydrograph according to a fixed flow volume (7,000,000 cubic feet). Each flow-weighted sample had a volume of 4-liters.

The flow meter was programmed to calculated the flow based on Manning's equation for a rectangular channel using the data given in Table 1. The flow meter continuously recorded water level in the Creek. Every four hours the total volume of discharge was printed, and every twenty-four hours a summary report indicating the minimum and maximum level (in feet), minimum and maximum flow (cfs), average flow (cfs), interval flow volume (in ft^3), total flow volume (in ft^3), number of storm water samples collected, and interval rainfall amount (in inches) were recorded.

Source: USGS Topographic Map, Photorevised 1972
7.5 Minute Quad, Suwanee, GA

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National Park Service
Atlanta, Georgia

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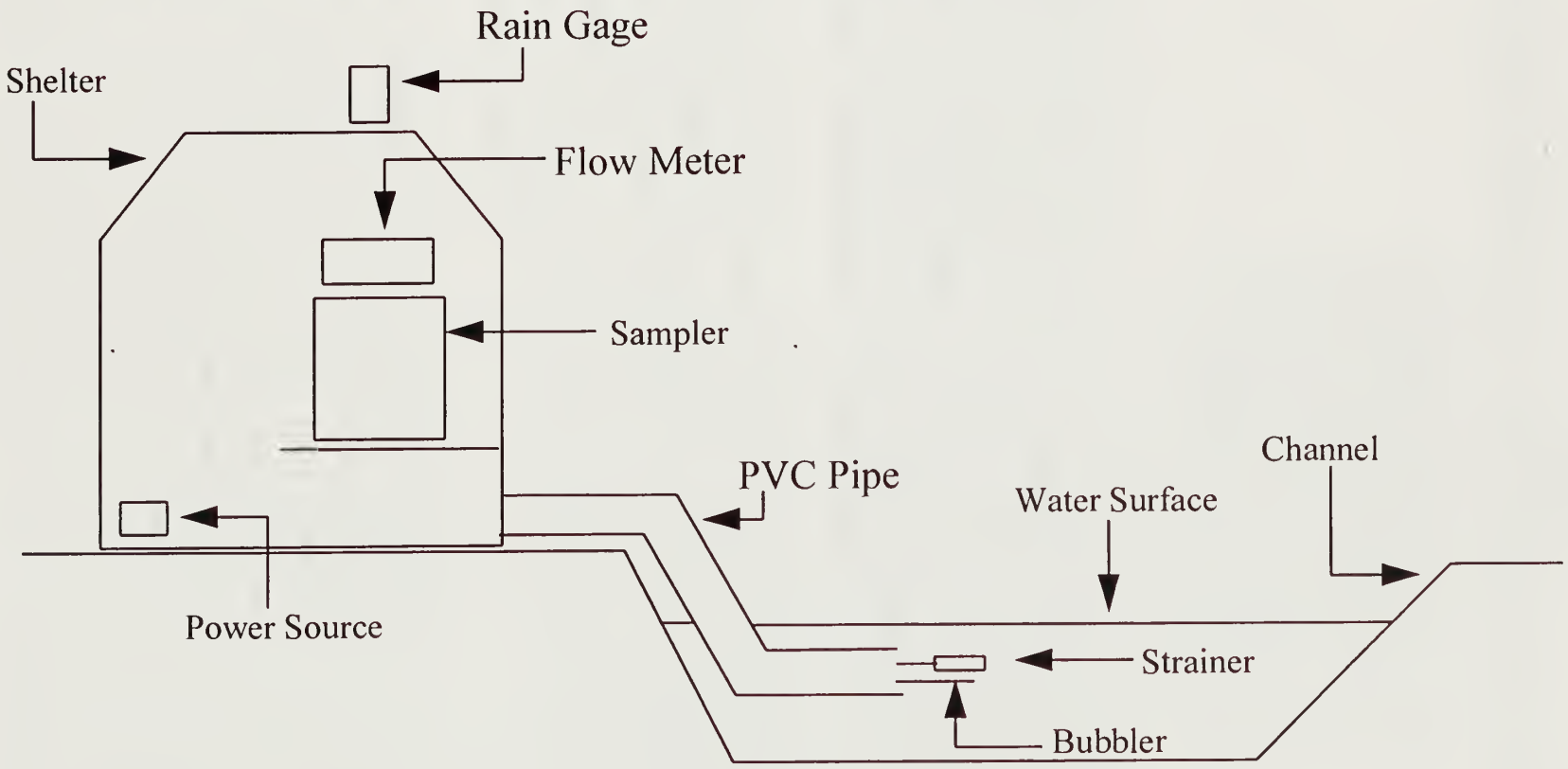
Suwanee Creek
Monitoring Station Location

Project 55-3510

Figure 5



Prepared/Date: mes 01/30/96
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Atlanta, Georgia

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Equipment Configuration

Project 55-3510

Figure 6

TABLE 1

MANNING'S EQUATION DATA FOR SUWANEE CREEK AT BUFORD HIGHWAY

Parameter	Data
Channel Shape	Rectangular
Slope (ft/ft)	0.01
Roughness (n)	0.03
Width (ft)	40

The sampling equipment was checked and maintained at least once a week. During each visit, the equipment was checked for damage, the rain gage was cleaned, and the water level chart recorder paper, ribbon, and desiccants were checked and replaced, if necessary. In addition, the sampler strainer was tested for clogging, the bubbler rate was checked, the measured water level on the bubbler was compared to the actual water level and adjusted, if necessary. The power source was also checked, and replaced with a fully charged battery, if necessary.

If a storm water sample was collected, the sampler was interrogated and the discharge, rainfall, and storm water sampling data were downloaded. The storm water samples were transferred to the appropriate labeled sample bottles. Chain of custody forms were completed and the samples were properly packed in coolers, iced, and delivered to either Law Environmental National Laboratories (LENL) or Analytical Services Inc., (ASI) for analyses. Before the bottles were reused, they were thoroughly rinsed with creek water.

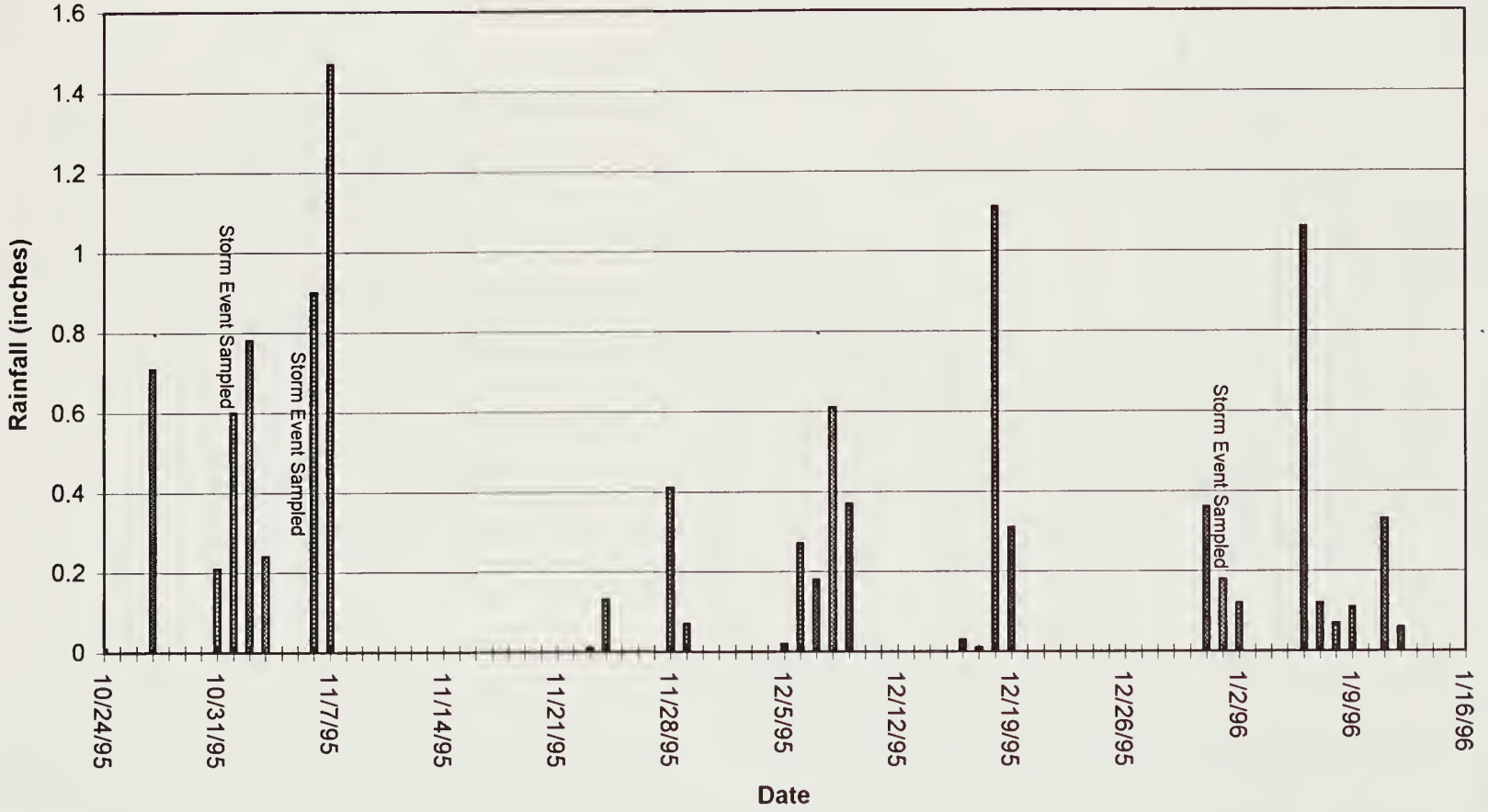
Storm water samples were collected during three qualifying storm events. A qualifying storm event had to be proceeded by at least 72 hours of dry weather (less than 0.1 inches of rain), had to have a total rainfall depth of at least 0.25 inches of rain within the watershed, runoff had to be produced, and a grab sample plus at least three composite samples had to be collected. The minimum rainfall depth requirement was greater than the "qualifying storm event" rainfall depth defined in 40 CFR Part 122.26 (Storm Water NPDES Permit Program) of at least 0.1 inches. The greater rainfall depth requirement was to assure that runoff would be produced and a sufficient hydrograph would be sampled in the watersheds. The first storm event sampled occurred on November 1 and 2, 1995, the second storm event occurred on November 6 and 7, 1995, and the third event sampled occurred

on December 31, 1995 and January 1, 1996 (see Figure 7). Table 2 summarizes the information on these storm events.

TABLE 2

STORM EVENTS SAMPLED

Date storm sampled	11/01/95-11/02/95	11/06/95-11/07/95	12/31/95-01/01/96
Total rainfall (inches)	1.62	2.37	0.66
Storm duration (hours)	41.25	21	52.5
Duration between the storm event sampled and the end of the last measurable storm event (hours)	116.5	76	296.5
Estimate of maximum height (ft)	4.99	9.21	1.72
Estimate of total volume of discharge sampled (ft^3)	372,314,000	600,714,000	122,979,000



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Checked/Date: mes 01/30/96

National Park Service
Atlanta, Georgia

LAW
Engineering and Environmental Services

Rainfall Measured at Suwanee Creek
from October 24, 1995 to January 16, 1995

Project 55-3510

Figure 7

3.0 LABORATORY RESULTS

The storm water samples were collected and delivered to either LENL or ASI for analyses. The LENL samples were analyzed for pH, five-day Biochemical Oxygen Demand (BOD-5), Chemical Oxygen Demand (COD), total Kjeldahl nitrogen (TKN), ammonia, nitrate plus nitrite, total phosphorus, ortho-phosphate, total phosphorus, total suspended solids (TSS), and turbidity. The ASI samples were be analyzed for fecal coliform. All samples were delivered to the laboratory as soon as possible, but due to the automated nature of the sampling activity, the six hour holding time for fecal coliform samples may have been exceeded. The laboratory results are included in Appendix A and are summarized in Table 3.

TABLE 3

SUWANEE CREEK STORM WATER DATA

Chattahoochee River Modeling Project
National Park Service
Atlanta, Georgia

Station: TR0060 Suwanee Creek at US 23 Buford Hwy.
Dates: November 1995-January 1996
Description: Stormwater Sampling Data for SWMM modeling
Source: Law Engineering and Environmental Services, Inc.
Entered by: Martin Smith, LAW Date: 01/23/96 Check: Elizabeth A. Booth, LAW Date: 01/30/96

DATE	TIME edt	pH S.U.	BOD5 mg/L	COD mg/L	NTKN mg/L	NH3 mg/L	NO2NO3 mg/L	PTotal mg/L	POrtho mg/L	FECAL #/100	SS mg/L	Turbidity N.T.U.
11/01/95	23:44	7.4	3.0	8.3	<0.10	0.073	0.31	0.046	0.012	1300	43	32
11/02/95	01:34	7.3	<2.0	11	0.32	0.094	0.25	0.08	<0.010	1500	220	160
11/02/95	03:46	7.2	<2.0	12	<0.10	0.082	0.28	0.071	<0.010	1200	60	110
11/02/95	05:43	7.2	<2.0	13	0.17	0.068	0.29	0.1	<0.010	2000	170	180
11/02/95	07:16	7.3	2.1	16	0.33	0.16	0.32	0.19	<0.010	2300	97	55
11/02/95	08:37	7.2	<2.0	18	0.13	0.094	0.28	0.21	<0.010	2400	170	110
11/06/95	21:34	7.2	2.4	8.6	0.12	<0.030	0.33	0.098	<0.010	300	60	47
11/06/95	23:21	7.2	2.1	8.3	0.74	0.039	0.28	0.23	<0.010	200	260	140
11/07/95	01:02	7.2	2.2	6.9	0.39	0.037	0.25	0.3	<0.010	500	400	230
11/07/95	02:26	7.2	2.0	10	0.54	<0.030	0.34	0.15	0.014	630	140	93
11/07/95	03:37	7.2	2.3	14	0.66	<0.030	0.33	0.23	<0.010	270	200	170
11/07/95	04:41	7.1	2.2	19	0.53	<0.030	0.32	0.25	<0.010	1900	230	160
12/31/95	21:16	7.3	4.6	10	0.67	0.34	0.54	0.076	0.013	3500	<10	14
01/01/96	01:42	7.3	2.3	11	0.62	0.21	0.50	0.085	0.015	2900	<10	16
01/01/96	05:57	7.3	3.5	11	0.88	0.38	0.53	0.096	0.016	3600	13	20
01/01/96	09:57	7.3	3.0	11	0.86	0.42	0.52	0.11	0.015	3100	18	22
01/01/96	14:14	7.3	2.6	10	0.63	0.32	0.53	0.089	0.014	2800	<10	18
01/01/96	18:27	7.3	2.2	6.8	0.59	0.25	0.50	0.061	0.018	2000	13	20

Notes: Clock times are Eastern Daylight Time (edt)
Clock time represent the beginning of the sampling interval
Dates are formatted as Long Date International mm/dd/yy
Times are formatted hh/mm

APPENDIX A

LABORATORY REPORTS

LAW
ENGINEERING AND ENVIRONMENTAL SERVICES

November 13, 1995

Liz Booth
Law Engineering and Environmental Services, Inc.
112 TownPark Drive
Kennesaw, GA 30144

Subject: **Chemical analysis of samples received on 11/02/95**
Project Number: 55-3510 P03 T001

Dear Ms. Booth:

Law Environmental National Laboratories has completed its analysis of your samples and reports the results on the following pages. These results relate only to the contents of the samples as submitted. This report shall not be reproduced except in full without the approval of Law Environmental National Laboratories.

If there are any questions, please do not hesitate to contact Rhonda K. Arnwine at (404)-421-3306.

Sincerely,

LAW ENVIRONMENTAL NATIONAL LABORATORIES

Patrick Kelley for (11-13-95)

W. Paul Brafford
Laboratory Manager

WPB:pah

Enclosures: Data Report
Invoice

LAW ENVIRONMENTAL, INC.
NATIONAL LABORATORIES
112 TOWN PARK DRIVE • KENNESAW, GA 30144
(404) 421-3400 • FAX (404) 421-3486

ONE OF THE LAW COMPANIES

LAW ENVIRONMENTAL NATIONAL LABORATORIES
TEST DATA REPORT

Date 11/13/95
Page 1

--- Project Information ---

Lab Number : 95-2826-01
Project No. : 55-3510 PHASE 03, T001 Cust. No. :
Project Name : CHATTAHOOCHEE STORM WATER

Manager: LIZ BOOTH

--- Sample Information ---

Station ID : SUWANEE CK 1-4 Sampled Date/Time : 11/01/95 23:44
Matrix : W Received Date/Time : 11/02/95 16:00
Type : GRAB Received From/By : EAB/CE
Collector : EAB Chain of Custody : 30134
Number of Containers : 3

arameter.....	Method....	Units	DL.....	Results...	Test Date	Analy
- INORGANIC CHEMISTRY RESULTS --						
iochemical Oxygen Demand (5-Day)	EPA 405.1	mg/l	2.0	3.0	11/03/95	RH
hemical Oxygen Demand (Low)	EPA 410.4	mg/l	5.0	8.3	11/09/95	RH
itrogen, Ammonia	EPA 350.1	mg/l	0.030	0.073	11/06/95	JAS
itrogen, Nitrate-Nitrite	EPA 353.2	mg/l	0.050	0.31	11/10/95	WDF
rtho Phosphate (as P)	EPA 365.1	mg/l	0.010	0.012	11/03/95	DF
H	EPA 150.1	units	2.0-13.0	7.4	11/02/95	JAS
hosphorus, Total	EPA 365.1	mg/l	0.010	0.046	11/07/95	DF
esidue, Non Filterable (TSS)	EPA 160.2	mg/l	10	43	11/06/95	RH
otal Kjeldahl Nitrogen	EPA 351.2	mg/l	0.10	ND	11/09/95	JAS
urbidity	EPA 180.1	N.T.U	0.70	32	11/03/95	GW

emarks:
DL = Detection Limit ND = Not Detected at the DL
Unless otherwise noted, all soil test results are calculated based on dry weight.

Signed Patrick Kelley

LAW ENVIRONMENTAL NATIONAL LABORATORIES
TEST DATA REPORT

Date 11/13/95
Page 1

--- Project Information ---

Lab Number : 95-2826-01
Project No. : 55-3510 PHASE 03, T001 Cust. No. :
Project Name : CHATTAHOOCHEE STORM WATER

Manager: LIZ BOOTH

--- Sample Information ---

Station ID : SUWANEE CK 1-4 Sampled Date/Time : 11/01/95 23:44
Matrix : W Received Date/Time : 11/02/95 16:00
Type : GRAB Received From/By : EAB/CE
Collector : EAB Chain of Custody : 30134
Number of Containers : 3

Parameter	Method	Units	DL	Results	Test Date	Analy
- INORGANIC CHEMISTRY RESULTS --						
Biochemical Oxygen Demand (5-Day)	EPA 405.1	mg/l	2.0	3.0	11/03/95	RH
Chemical Oxygen Demand (Low)	EPA 410.4	mg/l	5.0	8.3	11/09/95	RH
Nitrogen, Ammonia	EPA 350.1	mg/l	0.030	0.073	11/06/95	JAS
Nitrogen, Nitrate-Nitrite	EPA 353.2	mg/l	0.050	0.31	11/10/95	WDF
Ortho Phosphate (as P)	EPA 365.1	mg/l	0.010	0.012	11/03/95	DF
pH	EPA 150.1	units	2.0-13.0	7.4	11/02/95	JAS
Phosphorus, Total	EPA 365.1	mg/l	0.010	0.046	11/07/95	DF
Residue, Non Filterable (TSS)	EPA 160.2	mg/l	10	43	11/06/95	RH
Total Kjeldahl Nitrogen	EPA 351.2	mg/l	0.10	ND	11/09/95	JAS
Turbidity	EPA 180.1	N.T.U	0.70	32	11/03/95	GW

Remarks:
DL = Detection Limit ND = Not Detected at the DL
Unless otherwise noted, all soil test results are calculated based on dry weight.

Signed Patrick Kelley

LAW ENVIRONMENTAL NATIONAL LABORATORIES
TEST DATA REPORT

te 11/13/95
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--- Project Information ---

Lab Number : 95-2826-02
Project No. : 55-3510 PHASE 03, T001 Cust. No. :
Project Name : CHATTAHOOCHEE STORM WATER

Manager: LIZ BOOTH

--- Sample Information ---

Station ID : SUWANEE CK 5-8 Sampled Date/Time : 11/02/95 01:34
Matrix : W Received Date/Time : 11/02/95 16:00
Type : GRAB Received From/By : EAB/CE
Collector : EAB Chain of Custody : 30134
Number of Containers : 3

ameter.....	Method....	Units	DL.....	Results...	Test Date	Analy
INORGANIC CHEMISTRY RESULTS --						
chemical Oxygen Demand (5-Day)	EPA 405.1	mg/l	2.0	ND	11/03/95	RH
mical Oxygen Demand (Low)	EPA 410.4	mg/l	5.0	11	11/09/95	RH
rogen, Ammonia	EPA 350.1	mg/l	0.030	0.094	11/06/95	JAS
rogen, Nitrate-Nitrite	EPA 353.2	mg/l	0.050	0.25	11/10/95	WDF
ho Phosphate (as P)	EPA 365.1	mg/l	0.010	ND	11/03/95	DF
	EPA 150.1	units	2.0-13.0	7.3	11/02/95	JAS
sphorus, Total	EPA 365.1	mg/l	0.010	0.080	11/07/95	DF
idue, Non Filterable (TSS)	EPA 160.2	mg/l	10	220	11/06/95	RH
al Kjeldahl Nitrogen	EPA 351.2	mg/l	0.10	0.32	11/09/95	JAS
bidity	EPA 180.1	N.T.U	0.70	160	11/03/95	GW

arks:
DL = Detection Limit ND = Not Detected at the DL
Unless otherwise noted, all soil test results are calculated based on dry weight.

Signed Patrick Kelley

LAW ENVIRONMENTAL NATIONAL LABORATORIES
TEST DATA REPORT

ate 11/13/95
age 1

--- Project Information ---

Lab Number : 95-2826-03
Project No. : 55-3510 PHASE 03, T001 Cust. No. :
Project Name : CHATTAHOOCHEE STORM WATER

Manager: LIZ BOOTH

--- Sample Information ---

Station ID : SUWANEE CK 9-12 Sampled Date/Time : 11/02/95 03:46
Matrix : W Received Date/Time : 11/02/95 16:00
Type : GRAB Received From/By : EAB/CE
Collector : EAB Chain of Custody : 30134
Number of Containers : 3

arameter.....	Method....	Units	DL.....	Results...	Test Date	Analy
- INORGANIC CHEMISTRY RESULTS --						
iochemical Oxygen Demand (5-Day)	EPA 405.1	mg/l	2.0	ND	11/03/95	RH
hemical Oxygen Demand (Low)	EPA 410.4	mg/l	5.0	12	11/09/95	RH
itrogen, Ammonia	EPA 350.1	mg/l	0.030	0.082	11/06/95	JAS
itrogen, Nitrate-Nitrite	EPA 353.2	mg/l	0.050	0.28	11/10/95	WDF
rtho Phosphate (as P)	EPA 365.1	mg/l	0.010	ND	11/03/95	DF
H	EPA 150.1	units	2.0-13.0	7.2	11/02/95	JAS
hosphorus, Total	EPA 365.1	mg/l	0.010	0.071	11/03/95	DF
esidue, Non Filterable (TSS)	EPA 160.2	mg/l	10	60	11/06/95	RH
otal Kjeldahl Nitrogen	EPA 351.2	mg/l	0.10	ND	11/09/95	JAS
urbidity	EPA 180.1	N.T.U	0.70	110	11/03/95	GW

emarks:
DL = Detection Limit ND = Not Detected at the DL
Unless otherwise noted, all soil test results are calculated based on dry weight.

Signed Patrick Kelley

LAW ENVIRONMENTAL NATIONAL LABORATORIES
TEST DATA REPORT

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--- Project Information ---

Lab Number : 95-2826-04
Project No. : 55-3510 PHASE 03, T001 Cust. No. :
Project Name : CHATTAHOOCHEE STORM WATER

Manager: LIZ BOOTH

--- Sample Information ---

Station ID : SUWANEE CK 13-16 Sampled Date/Time : 11/02/95 05:43
Matrix : W Received Date/Time : 11/02/95 16:00
Type : GRAB Received From/By : EAB/CE
Collector : EAB Chain of Custody : 30134
Number of Containers : 3

arameter.....	Method....	Units	DL.....	Results...	Test Date	Analy
- INORGANIC CHEMISTRY RESULTS --						
iochemical Oxygen Demand (5-Day)	EPA 405.1	mg/l	2.0	ND	11/03/95	RH
hemical Oxygen Demand (Low)	EPA 410.4	mg/l	5.0	13	11/09/95	RH
itrogen, Ammonia	EPA 350.1	mg/l	0.030	0.068	11/06/95	JAS
itrogen, Nitrate-Nitrite	EPA 353.2	mg/l	0.050	0.29	11/10/95	WDF
rtho Phosphate (as P)	EPA 365.1	mg/l	0.010	ND	11/03/95	DF
H	EPA 150.1	units	2.0-13.0	7.2	11/02/95	JAS
hosphorus, Total	EPA 365.1	mg/l	0.010	0.10	11/07/95	DF
esidue, Non Filterable (TSS)	EPA 160.2	mg/l	10	170	11/06/95	RH
otal Kjeldahl Nitrogen	EPA 351.2	mg/l	0.10	0.17	11/09/95	JAS
urbidity	EPA 180.1	N.T.U	0.70	180	11/03/95	GW

emarks:
DL = Detection Limit ND = Not Detected at the DL
Unless otherwise noted, all soil test results are calculated based on dry weight.

Signed Patrick Kelley

LAW ENVIRONMENTAL NATIONAL LABORATORIES
TEST DATA REPORT

Date 11/13/95
Page 1

--- Project Information ---

Lab Number : 95-2826-05
Project No. : 55-3510 PHASE 03, T001 Cust. No. :
Project Name : CHATTAHOOCHEE STORM WATER

Manager: LIZ BOOTH

--- Sample Information ---

Station ID : SUWANEE CK 17-20 Sampled Date/Time : 11/02/95 07:16
Matrix : W Received Date/Time : 11/02/95 16:00
Type : GRAB Received From/By : EAB/CE
Collector : EAB Chain of Custody : 30134
Number of Containers : 3

Parameter	Method	Units	DL	Results	Test Date	Anal
-- INORGANIC CHEMISTRY RESULTS --						
Biochemical Oxygen Demand (5-Day)	EPA 405.1	mg/l	2.0	2.1	11/03/95	RH
Chemical Oxygen Demand (Low)	EPA 410.4	mg/l	5.0	16	11/09/95	RH
Nitrogen, Ammonia	EPA 350.1	mg/l	0.030	0.16	11/06/95	JAS
Nitrogen, Nitrate-Nitrite	EPA 353.2	mg/l	0.050	0.32	11/10/95	WDF
Ortho Phosphate (as P)	EPA 365.1	mg/l	0.010	ND	11/03/95	DF
pH	EPA 150.1	units	2.0-13.0	7.3	11/02/95	JAS
Phosphorus, Total	EPA 365.1	mg/l	0.010	0.19	11/07/95	DF
Residue, Non Filterable (TSS)	EPA 160.2	mg/l	10	97	11/06/95	RH
Total Kjeldahl Nitrogen	EPA 351.2	mg/l	0.10	0.33	11/09/95	JAS
Turbidity	EPA 180.1	N.T.U	0.70	55	11/03/95	GW

Remarks:
DL = Detection Limit ND = Not Detected at the DL
Unless otherwise noted, all soil test results are calculated based on dry weight.

Signed Patrick Kelley

LAW ENVIRONMENTAL NATIONAL LABORATORIES
TEST DATA REPORT

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--- Project Information ---

Lab Number : 95-2826-06
Project No. : 55-3510 PHASE 03, T001 Cust. No. :
Project Name : CHATTAHOOCHEE STORM WATER

Manager: LIZ BOOTH

--- Sample Information ---

Station ID : SUWANEE CK 21-24 Sampled Date/Time : 11/02/95 08:37
Matrix : W Received Date/Time : 11/02/95 16:00
Type : GRAB Received From/By : EAB/CE
Collector : EAB Chain of Custody : 30134
Number of Containers : 3

rameter.....	Method....	Units	DL.....	Results...	Test Date	Analy
- INORGANIC CHEMISTRY RESULTS --						
ochemical Oxygen Demand (5-Day)	EPA 405.1	mg/l	2.0	ND	11/03/95	RH
emical Oxygen Demand (Low)	EPA 410.4	mg/l	5.0	18	11/09/95	RH
itrogen, Ammonia	EPA 350.1	mg/l	0.030	0.094	11/06/95	JAS
itrogen, Nitrate-Nitrite	EPA 353.2	mg/l	0.050	0.28	11/10/95	WDF
tho Phosphate (as P)	EPA 365.1	mg/l	0.010	ND	11/03/95	DF
	EPA 150.1	units	2.0-13.0	7.2	11/02/95	JAS
hosphorus, Total	EPA 365.1	mg/l	0.010	0.21	11/07/95	DF
sidue, Non Filterable (TSS)	EPA 160.2	mg/l	10	170	11/06/95	RH
tal Kjeldahl Nitrogen	EPA 351.2	mg/l	0.10	0.13	11/09/95	JAS
urbidity	EPA 180.1	N.T.U	0.70	110	11/03/95	GW

marks:
DL = Detection Limit ND = Not Detected at the DL
Unless otherwise noted, all soil test results are calculated based on dry weight.

Signed Patricia Kelley

95-2826
30134

LAW ENVIRONMENTAL, INC.
NATIONAL LABORATORY
112 TOWNPARK DRIVE
KENNESAW, GEORGIA 30144
(404) 421-3389

CHAIN OF CUSTODY RECORD

SAMPLING INFORMATION
NAME OF FACILITY: Suwanee @ Buford Hwy
STREET ADDRESS:
CITY / STATE: ZIP:

PROJECT NAME: Chattahoochee Storm Water
JOB NO.: 55-3510
SAMPLERS (SIGNATURE): Elizabeth A Beatl
SAMPLERS INITIALS (PRINT): EAB
SAMPLING DATE: 11/1-2/95

TIME	GRAB	COMP.	* MATRIX	SAMPLE STATION DESCRIPTION	TOTAL NO. OF CONTAINERS	CONTAINER TYPE G = GLASS PL = PLASTIC: 40 ml G VOA Vial (HCl)	40 ml G VOA Vial	1 L G Amber Bottle	500 ml G Amber Bottle (H_2SO_4)	1 L PL Bottle	1 L PL Amber Bottle	1 L PL Bottle (HNO_3)	1 L PL Bottle (H_2SO_4)	1 L PL Bottle (Ascorbic Acid + NaOH)	250 ml PL Bottle (Zn Acetate + NaOH)	Teflon Bottle	32 oz. G Jar (H_2SO_4)	8 oz. G Jar	4 oz. G Jar	2 oz. G SEPTA Jar	FOR LAB USE ONLY
23:44	X		W	Suwanee Ck 1-4	3					1	1		1								95-2826-01
1:34	X		W	Suwanee Ck 5-8	3					1	1		1								02
3:46	X		W	Suwanee Ck 9-12	3					1	1		1								03
5:43	X		W	Suwanee Ck 13-16	3					1	1		1								04
7:16	X		W	Suwanee Ck 17-20	3					1	1		1								05
8:37	X		W	Suwanee Ck 21-24	3					1	1		1								06

RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)	DATE / TIME	RELINQUISHED BY: (SIGNATURE)	RECEIVED BY LABORATORY: (SIGNATURE)	DATE / TIME
Elizabeth A Beatl	11/2/95 16:00				Chevi Edmunds	11/2/95 1600

*MATRIX
WATER - W
SOIL / SEDIMENT - SO
OTHER - NA

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REMARKS

For Law Environmental National Lab Use Only

Are Custody Seals Present? Yes ☐ No ☑ Are Custody Seals Intact? Yes ☐ No ☐ N/A ☑ Inspected By: Chevi Edmunds Date: 11/2/95

LAW ENVIRONMENTAL, INC.
NATIONAL LABORATORY
112 TOWNPARK DRIVE
KENNESAW, GEORGIA 30144
(404) 421-3306

KENNESAW REQUEST FOR ANALYSIS

95-2826

Phase 03

PROJECT NAME: Chattahoochee Storm Water PROJECT #: 55-3510 TASK#: 001

PROJECT MANAGER: Liz Booth. TURNAROUND TIME (3 WKS) X RUSH _____ (INCURS RUSH FEE)
DAYS

SAMPLE I.D.: Suwanee Creek

METALS (CIRCLE ELEMENT REQUESTED & ONE METHOD PER ELEMENT)

TOTAL _____ OR DISSOLVED _____

ELEMENT	ICP/FLAME	FURNACE	ELEMENT	ICP/FLAME	FURNACE
ALUMINUM	6010	——	MOLYBDENUM	6010	——
ANTIMONY	6010/7041	——	MERCURY	7470/7471	AA COLD VAPOR
ARSENIC	6010	7060	NICKEL	6010/7520	7521/249.2
BARIUM	6010	——	POTASSIUM	6010	——
BERYLLIUM	6010/7090	7091	SELENIUM	6010	7740
CADMIUM	6010/7130	7131	SILVER	6010/7760	7761
CALCIUM	6010	——	SODIUM	6010	——
CHROMIUM	6010/7190	7191	STRONTIUM	6010	——
COBALT	6010	7201	THALLIUM	6010	7911
COPPER	6010/7210	——	TIN	6010	——
IRON	6010	——	TITANIUM	6010	——
LEAD	6010/7420	7421/239.2	VANADIUM	6010	7911
MAGNESIUM	6010	——	ZINC	6010/7950	——
MANGANESE	6010/7460	——	8 RCRA METALS*		

*As (7060), Ba (6010), Cd (6010), Cr (6010), Pb (6010), Hg (CV), SE (7740), Ag (6010)

INORGANICS (PLEASE COMPLETE BELOW): BOD, COD, TSS
TKN, NO_2+NO_3, Nitr, Total P
Ortho-P, pH & Turbidity

ADDITIONAL ANALYSIS (PLEASE COMPLETE BELOW): _____

FORM COMPLETED BY: Elizabeth A Booth. DATE: 11/2/95

GC (CIRCLE ANALYSES REQUESTED)	WATER/SOIL	WATER
HALOGENATED VOLATILE ORGANICS	8010	601
AROMATIC VOLATILE ORGANICS	8020	602
PHENOLS (NON-DERIVATED)	8040	604
PESTICIDES AND/OR PCB'S	8080	608
POLYNUCLEAR AROMATIC HYDROCARBONS (PAH)	8100	610
HERBICIDES (2,4-D & 2, 4, 5-TP)	8150	——
ETHYLENE DIBROMIDE (EDB)	——	504

GC/MS (CIRCLE ANALYSES REQUESTED)	WATER/SOIL	WATER
VOLATILE ORGANICS	8240	624
ACID EXTRACTABLES	8270	625
BASE NEUTRAL EXTRACTABLES	8270	625

PRIORITY POLLUTANT ANALYSIS (CIRCLE ANALYSIS REQUESTED)
PRIORITY POLLUTANT SCAN
PRIORITY POLLUTANT ORGANICS
PRIORITY POLLUTANT INORGANICS

RCRA HAZARDOUS WASTE IDENTIFICATION (CIRCLE ANALYSIS REQUESTED)	
TCLP METALS	IGNITABILITY
TCLP HERBICIDES	CORROSIVITY (pH)
TCLP PESTICIDES	REACTIVITY (HCN, H2S)
TCLP ACID EXTRACTABLES	EP-TOX METALS
TCLP BASE NEUTRALS EXTRACTABLES	EP-TOX PESTICIDES
TCLP VOLATILES	EP-TOX HERBICIDES

ASI
ANALYTICAL SERVICES, INC.
ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS
0 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(404) 734-4200 • FAX (404) 734-4201

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LABORATORY REPORT

Law Environmental - National Laboratory
112 Town Park Drive
Kennesaw, GA 30144

November 8, 1995

Attention: Ms. Elizabeth Booth

Report No. 67287

Sample: Water, grab, Chattahoochee, Project #55-3510, received 11/2/95

RESULTS

		Fecal Coliform (no/100ml) (SM 9222 D)
-1)	Suwanee Ck 1-4, 11/1/95, 23:44.....	1,300
-2)	Suwanee Ck 5-8, 11/2/95, 01:34.....	1,500
-3)	Suwanee Ck 9-12, 11/2/95, 03:46.....	1,200
-4)	Suwanee Ck 13-16, 11/2/95, 05:43.....	2,000
-5)	Suwanee Ck 17-20, 11/2/95, 07:16.....	2,300
-6)	Suwanee Ck 21-24, 11/2/95, 08:37.....	2,400
	Detection Limit.....	100

Respectfully submitted,
By: Rachel Fred

LAW ENVIRONMENTAL, INC.
NATIONAL LABORATORY
112 TOWNPARK DRIVE
KENNESAW, GEORGIA 30144
(404) 421-3389

CHAIN OF CUSTODY RECORD

33441

SAMPLING INFORMATION

NAME OF FACILITY: Liz Booth / LAW
STREET ADDRESS: 112 Town Park Drive
CITY / STATE: Kennesaw GA ZIP: 30144

PROJECT NAME: Chattahoochee Storm Water
JOB NO.: 55-3510
SAMPLERS (SIGNATURE): Elizabeth A Booth
SAMPLERS INITIALS (PRINT): EAB
SAMPLING DATE: 11/1-2/95

	TIME	GRAB	COMP.	* MATRIX	SAMPLE STATION DESCRIPTION	TOTAL NO. OF CONTAINERS	40 ml G VOA Vial (HCl)	40 ml G VOA Vial	1 L G Amber Bottle	500 ml G Amber Bottle (H_2SO_4)	1 L PL Bottle	1 L PL Amber Bottle	1 L PL Bottle (HNO_3)	1 L PL Bottle (H_2SO_4)	1 L PL Bottle (Ascorbic Acid + NaOH)	250 ml PL Bottle (Zn Acetate + NaOH)	Teflon Bottle	32 oz. G Jar (H_2SO_4)	8 oz. G Jar	4 oz. G Jar	2 oz. G SEPTA Jar	Coming Jar	FOR LA USE ON
11/1	23:44	X		W	Suwanee Ck 1-4	1														1			
	1:34	X		W	Suwanee Ck 5-8	1														1			
	3:46	X		W	Suwanee Ck 9-12	1														1			
	5:43	X		W	Suwanee CK 13/6	1														1			
	7:16	X		W	Suwanee Ck 17-20	1														1			
	8:37	X		W	Suwanee Ck 21-24	1														1			

RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)	DATE / TIME	RELINQUISHED BY: (SIGNATURE)	RECEIVED BY LABORATORY: (SIGNATURE)	DATE / T
Elizabeth A Booth	11/2/95 14:40				K. S. B.	11/2

*MATRIX
WATER - W
SOIL / SEDIMENT - SO
OTHER - NA

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REMARKS Analysis fecal coliform. No ice No cool T = ambient 6 containers

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LAW
ENGINEERING AND ENVIRONMENTAL SERVICES

November 29, 1995

Liz Booth
Law Engineering and Environmental Services, Inc.
112 TownPark Drive
Kennesaw, GA 30144

Subject: **Chemical analysis of samples received on 11/08/95**
Project Number: 55-3510

Dear Ms. Booth:

Law Environmental National Laboratories has completed its analysis of your samples and reports the results on the following pages. These results relate only to the contents of the samples as submitted. This report shall not be reproduced except in full without the approval of Law Environmental National Laboratories.

If there are any questions, please do not hesitate to contact Rhonda K. Arnwine at (404)-421-3306.

Sincerely,

LAW ENVIRONMENTAL NATIONAL LABORATORIES

W. Paul Brafford
Laboratory Manager

WPB:pah

Enclosures: Data Report
Invoice

LAW ENVIRONMENTAL, INC.
NATIONAL LABORATORIES
112 TOWN PARK DRIVE • KENNESAW, GA 30144
(404) 421-3400 • FAX (404) 421-3486

ONE OF THE LAW COMPANIES

LAW ENVIRONMENTAL NATIONAL LABORATORIES
TEST DATA REPORT

te 11/29/95
ge 1

--- Project Information ---

Lab Number : 95-2882-01
Project No. : 55-3510 Cust. No. :
Project Name : CHATTAHOOCHEE

Manager: LIZ BOOTH

--- Sample Information ---

Station ID : SUWANEE CK 1-4 Sampled Date/Time : 11/06/95 21:34
Matrix : W Received Date/Time : 11/08/95 19:20
Type : GRAB Received From/By : MG/CE
Collector : MPG Chain of Custody : 33427
Number of Containers : 3

rameter	Method	Units	DL	Results	Test Date	Analy
INORGANIC CHEMISTRY RESULTS --						
chemical Oxygen Demand (5-Day)	EPA 405.1	mg/l	2.0	2.4	11/08/95	RH
mical Oxygen Demand (Low)	EPA 410.4	mg/l	5.0	8.6	11/19/95	GW
rogen, Ammonia	EPA 350.1	mg/l	0.030	ND	11/14/95	JAS
rogen, Nitrate-Nitrite	EPA 353.2	mg/l	0.050	0.33	11/10/95	WDF
ho Phosphate (as P)	EPA 365.1	mg/l	0.010	ND	11/09/95	JAS
	EPA 150.1	units	2.0-13.0	7.2	11/08/95	JAS
sphorus, Total	EPA 365.1	mg/l	0.010	0.098	11/14/95	DF
idue, Non Filterable (TSS)	EPA 160.2	mg/l	10	60	11/11/95	GW
al Kjeldahl Nitrogen	EPA 351.2	mg/l	0.10	0.12	11/28/95	JAS
bidity	EPA 180.1	N.T.U	0.70	47	11/08/95	JAS

arks:
DL = Detection Limit ND = Not Detected at the DL
Unless otherwise noted, all soil test results are calculated based on dry weight.

Signed

LAW ENVIRONMENTAL NATIONAL LABORATORIES
TEST DATA REPORT

e 11/29/95
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--- Project Information ---

Lab Number : 95-2882-02
Project No. : 55-3510 Cust. No. :
Project Name : CHATTAHOOCHEE

Manager: LIZ BOOTH

--- Sample Information ---

Station ID : SUWANEE CK 5-8 Sampled Date/Time : 11/06/95 23:21
Matrix : W Received Date/Time : 11/08/95 19:20
Type : GRAB Received From/By : MG/CE
Collector : MPG Chain of Custody : 33427
Number of Containers : 3

ameter	Method	Units	DL	Results	Test Date	Analy
INORGANIC CHEMISTRY RESULTS --						
chemical Oxygen Demand (5-Day)	EPA 405.1	mg/l	2.0	2.1	11/08/95	RH
nical Oxygen Demand (Low)	EPA 410.4	mg/l	5.0	8.3	11/11/95	GW
rogen, Ammonia	EPA 350.1	mg/l	0.030	0.039	11/14/95	JAS
rogen, Nitrate-Nitrite	EPA 353.2	mg/l	0.050	0.28	11/10/95	WDF
no Phosphate (as P)	EPA 365.1	mg/l	0.010	ND	11/09/95	JAS
	EPA 150.1	units	2.0-13.0	7.2	11/08/95	JAS
sphorus, Total	EPA 365.1	mg/l	0.010	0.23	11/14/95	DF
idue, Non Filterable (TSS)	EPA 160.2	mg/l	10	260	11/11/95	GW
al Kjeldahl Nitrogen	EPA 351.2	mg/l	0.10	0.74	11/28/95	JS
oidity	EPA 180.1	N.T.U	0.70	140	11/08/95	JAS

arks:
DL = Detection Limit ND = Not Detected at the DL
Unless otherwise noted, all soil test results are calculated based on dry weight.

Signed

LAW ENVIRONMENTAL NATIONAL LABORATORIES
TEST DATA REPORT

Date 11/29/95
Page 1

--- Project Information ---

Lab Number : 95-2882-03
Project No. : 55-3510 Cust. No. :
Project Name : CHATTAHOOCHEE

Manager: LIZ BOOTH

--- Sample Information ---

Station ID : SUWANEE CK 9-12 Sampled Date/Time : 11/07/95 01:02
Matrix : W Received Date/Time : 11/08/95 19:20
Type : GRAB Received From/By : MG/CE
Collector : MPG Chain of Custody : 33427
Number of Containers : 3

Parameter	Method	Units	DL	Results	Test Date	Analy
-- INORGANIC CHEMISTRY RESULTS --						
Biochemical Oxygen Demand (5-Day)	EPA 405.1	mg/l	2.0	2.2	11/08/95	RH
Chemical Oxygen Demand (Low)	EPA 410.4	mg/l	5.0	6.9	11/11/95	GW
Nitrogen, Ammonia	EPA 350.1	mg/l	0.030	0.037	11/14/95	JAS
Nitrogen, Nitrate-Nitrite	EPA 353.2	mg/l	0.050	0.25	11/10/95	WDF
Ortho Phosphate (as P)	EPA 365.1	mg/l	0.010	ND	11/09/95	JAS
pH	EPA 150.1	units	2.0-13.0	7.2	11/08/95	JAS
Phosphorus, Total	EPA 365.1	mg/l	0.010	0.30	11/14/95	DF
Residue, Non Filterable (TSS)	EPA 160.2	mg/l	10	400	11/11/95	GW
Total Kjeldahl Nitrogen	EPA 351.2	mg/l	0.10	0.39	11/28/95	JAS
Turbidity	EPA 180.1	N.T.U	0.70	230	11/08/95	JAS

Remarks:
DL = Detection Limit ND = Not Detected at the DL
Unless otherwise noted, all soil test results are calculated based on dry weight.

Signed

LAW ENVIRONMENTAL NATIONAL LABORATORIES
TEST DATA REPORT

Date 11/29/95
Page 1

--- Project Information ---

Lab Number : 95-2882-04
Project No. : 55-3510 Cust. No. :
Project Name : CHATTAHOOCHEE

Manager: LIZ BOOTH

--- Sample Information ---

Station ID : SUWANEE CK 13-16 Sampled Date/Time : 11/07/95 02:26
Matrix : W Received Date/Time : 11/08/95 19:20
Type : GRAB Received From/By : MG/CE
Collector : MPG Chain of Custody : 33427
Number of Containers : 3

Parameter	Method	Units	DL	Results	Test Date	Analy
-- INORGANIC CHEMISTRY RESULTS --						
Biochemical Oxygen Demand (5-Day)	EPA 405.1	mg/l	2.0	2.0	11/08/95	RH
Chemical Oxygen Demand (Low)	EPA 410.4	mg/l	5.0	10	11/11/95	GW
Nitrogen, Ammonia	EPA 350.1	mg/l	0.030	ND	11/14/95	JAS
Nitrogen, Nitrate-Nitrite	EPA 353.2	mg/l	0.050	0.34	11/10/95	WDF
Ortho Phosphate (as P)	EPA 365.1	mg/l	0.010	0.014	11/09/95	JAS
PH	EPA 150.1	units	2.0-13.0	7.2	11/08/95	JAS
Phosphorus, Total	EPA 365.1	mg/l	0.010	0.15	11/14/95	DF
Residue, Non Filterable (TSS)	EPA 160.2	mg/l	10	140	11/11/95	GW
Total Kjeldahl Nitrogen	EPA 351.2	mg/l	0.10	0.54	11/28/95	JS
Turbidity	EPA 180.1	N.T.U	0.70	93	11/08/95	JAS

Remarks:
DL = Detection Limit ND = Not Detected at the DL
Unless otherwise noted, all soil test results are calculated based on dry weight.

Signed

LAW ENVIRONMENTAL NATIONAL LABORATORIES
TEST DATA REPORT

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--- Project Information ---

Lab Number : 95-2882-05
Project No. : 55-3510 Cust. No. :
Project Name : CHATTAHOOCHEE

Manager: LIZ BOOTH

--- Sample Information ---

Station ID : SUWANEE CK 17-20 Sampled Date/Time : 11/07/95 03:37
Matrix : W Received Date/Time : 11/08/95 19:20
Type : GRAB Received From/By : MG/CE
Collector : MPG Chain of Custody : 33427
Number of Containers : 3

rameter	Method	Units	DL	Results	Test Date	Analy
INORGANIC CHEMISTRY RESULTS --						
ochemical Oxygen Demand (5-Day)	EPA 405.1	mg/l	2.0	2.3	11/08/95	RH
emical Oxygen Demand (Low)	EPA 410.4	mg/l	5.0	14	11/11/95	GW
trogen, Ammonia	EPA 350.1	mg/l	0.030	ND	11/14/95	JAS
trogen, Nitrate-Nitrite	EPA 353.2	mg/l	0.050	0.33	11/10/95	WDF
tho Phosphate (as P)	EPA 365.1	mg/l	0.010	ND	11/09/95	JAS
	EPA 150.1	units	2.0-13.0	7.2	11/08/95	JAS
osphorus, Total	EPA 365.1	mg/l	0.010	0.23	11/14/95	DF
idue, Non Filterable (TSS)	EPA 160.2	mg/l	10	200	11/11/95	GW
al Kjeldahl Nitrogen	EPA 351.2	mg/l	0.10	0.66	11/28/95	JS
rbidity	EPA 180.1	N.T.U	0.70	170	11/08/95	JAS

arks:
DL = Detection Limit ND = Not Detected at the DL
Unless otherwise noted, all soil test results are calculated based on dry weight.

Signed

LAW ENVIRONMENTAL NATIONAL LABORATORIES
TEST DATA REPORT

e 11/29/95
e 1

--- Project Information ---

Lab Number : 95-2882-06
Project No. : 55-3510 Cust. No. :
Project Name : CHATTAHOOCHEE

Manager: LIZ BOOTH

--- Sample Information ---

Station ID : SUWANEE CK 21-24 Sampled Date/Time : 11/07/95 04:41
Matrix : W Received Date/Time : 11/08/95 19:20
Type : GRAB Received From/By : MG/CE
Collector : MPG Chain of Custody : 33427
Number of Containers : 3

ameter	Method	Units	DL	Results	Test Date	Analy
INORGANIC CHEMISTRY RESULTS --						
chemical Oxygen Demand (5-Day)	EPA 405.1	mg/l	2.0	2.2	11/08/95	RH
mical Oxygen Demand (Low)	EPA 410.4	mg/l	5.0	19	11/11/95	GW
rogen, Ammonia	EPA 350.1	mg/l	0.030	ND	11/14/95	JAS
rogen, Nitrate-Nitrite	EPA 353.2	mg/l	0.050	0.32	11/10/95	WDF
no Phosphate (as P)	EPA 365.1	mg/l	0.010	ND	11/09/95	JAS
	EPA 150.1	units	2.0-13.0	7.1	11/08/95	JAS
sphorus, Total	EPA 365.1	mg/l	0.010	0.25	11/14/95	DF
idue, Non Filterable (TSS)	EPA 160.2	mg/l	10	230	11/11/95	GW
al Kjeldahl Nitrogen	EPA 351.2	mg/l	0.10	0.53	11/28/95	JS
bidity	EPA 180.1	N.T.U	0.70	160	11/08/95	JAS

arks:
DL = Detection Limit ND = Not Detected at the DL
Unless otherwise noted, all soil test results are calculated based on dry weight.

Signed

LAW ENVIRONMENTAL, INC.
NATIONAL LABORATORY
112 TOWNPARK DRIVE
KENNESAW, GEORGIA 30144
(404) 421-3389

CHAIN OF CUSTODY RECORD

33427

SAMPLING INFORMATION

NAME OF FACILITY:
STREET ADDRESS:
CITY / STATE: ZIP:

PROJECT NAME: CHATTAHOOCHEE
JOB NO.: 55-3510
SAMPLERS (SIGNATURE): Meredith P. Gandy
SAMPLERS INITIALS (PRINT): MPG
SAMPLING DATE: NOV 6-7 1995

TIME	GRAB	COMP	* MATRIX	SAMPLE STATION DESCRIPTION	TOTAL NO. OF CONTAINERS	40 ml G VOA Vial (HCl)	40 ml G VOA Vial	1 L G Amber Bottle	500 ml G Amber Bottle (H_2SO_4)	1 L PL Bottle	1 L PL Amber Bottle	1 L PL Bottle (HNO_3)	1 L PL Bottle (H_2SO_4)	1 L PL Bottle (Ascorbic Acid + NaOH)	1 L PL Bottle (Zn Acetate + NaOH)	250 ml PL Bottle	Teflon Bottle	32 oz. G Jar (H_2SO_4)	8 oz G Jar	4 oz. G Jar	2 oz. G SEPTA Jar	FOR LAB USE ONLY
11-6-95 21:34	X		W	SUWANEE CK 1-4					1	1		1										95-2882-01
11-6-95 23:21	X		W	SUWANEE CK 5-8					1	1		1										02
11-7-95 01:02	X		W	SUWANEE CK 9-12					1	1		1										03
11-7-95 02:36	X		W	SUWANEE CK 13-16					1	1		1										04
11-7-95 03:37	X		W	SUWANEE CK 17-20																		05
11-7-95 04:41	X		W	SUWANEE CK 21-24																		06

RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)	DATE / TIME	RELINQUISHED BY: (SIGNATURE)	RECEIVED BY LABORATORY: (SIGNATURE)	DATE / TIME
Meredith P. Gandy	11/7 | 19:40			Meredith P. Gandy	Drew Edmunds	11/8 | 17

*MATRIX
WATER - W
SOIL / SEDIMENT - SO
OTHER - NA

DISTRIBUTION: ORIGINAL AND YELLOW COPIES ACCOMPANY SAMPLE SHIPMENT TO LABORATORY. PINK COPY RETAINED BY SAMPLERS. YELLOW COPY RETAINED BY LABORATORY.

REMARKS

For Law Environmental National Lab Use Only

Are Custody Seals Present? Yes ☑ No ☐ Are Custody Seals Intact? Yes ☑ No ☐ N/A ☐ Inspected By: Drew Edmunds Date: 11-8-95

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LABORATORY REPORT

Law Environmental - National Laboratory
112 Town Park Drive
Kennesaw, GA 30144

November 13, 1995

Attention: Ms. Elizabeth Booth

Report No. 67452

Sample: Water, grab, Chattahoochee, Project #55-3510, received 11/8/95

RESULTS

		Fecal Coliform (no/100ml) (SM 9222 D)
-1)	Suwanee Ck 1-4, 11/6/95, 21:34.....	300
-2)	Suwanee Ck 5-8, 11/6/95, 23:21.....	200
-3)	Suwanee Ck 9-12, 11/7/95, 01:02.....	500
-4)	Suwanee Ck 13-16, 11/7/95, 02:26.....	630
-5)	Suwanee Ck 17-20, 11/7/95, 03:37.....	270
-6)	Suwanee Ck 21-24, 11/7/95, 04:41.....	1900
	Detection Limit	100

Respectfully submitted,
By: Rachel Fried

NATIONAL LABORATORY
112 TOWNPARK DRIVE
KENNESAW, GEORGIA 30144
(404) 421-3389

55425

SAMPLING INFORMATION

NAME OF FACILITY: _____

STREET ADDRESS: _____

CITY / STATE: _____ ZIP: _____

PROJECT NAME	JOB NO.
Chattahoochee Storm Water	55-3510
SAMPLERS (SIGNATURE)	SAMPLERS INITIALS (PRINT)
[signature]	MPC
SAMPLING DATE	
NOV 6, 7 1995	

TIME	GRAB	COMP.	* MATRIX	SAMPLE STATION DESCRIPTION	TOTAL NO. OF CONTAINERS	1 L PL Bottle (Ascorbic Acid + NaOH)	250 ml PL Bottle (Zn Acetate + NaOH)	Teflon Bottle	32 oz. G Jar (H_2SO_4)	8 oz. G Jar	4 oz. G Jar	2 oz. G SEPTA Jar	FOR LAB USE ONLY
11-6 95 21:34	X		W	SUWANEE Ck 1-4								1	
11-6 95 23:21	X		W	SUWANEE CK 5-8								1	
11-7-95 01:02	X		W	SUWANEE CK 9-12								1	
11-7-95 02:26	X		W	SUWANEE CK 13-16								1	
11-7-95 03:37	X		W	SUWANEE CK 17-20								1	
11-7-95 04:41	X		W	SUWANEE Ck. 21-24								1	

CONTAINER TYPE: G = GLASS PL = PLASTIC; 40 ml G VOA Vial (HCl); 40 ml G VOA Vial; 1 L G Amber Bottle; 500 ml G Amber Bottle (H_2SO_4); 1 L PL Bottle; 1 L PL Amber Bottle; 1 L PL Bottle (HNO_3); 1 L PL Bottle (H_2SO_4); 1 L PL Bottle (Ascorbic Acid + NaOH); 1 L PL Bottle (Zn Acetate + NaOH); 250 ml PL Bottle; Teflon Bottle; 32 oz. G Jar (H_2SO_4); 8 oz. G Jar; 4 oz. G Jar; 2 oz. G SEPTA Jar; CORNING

RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)	DATE / TIME	RELINQUISHED BY: (SIGNATURE)	RECEIVED BY LABORATORY: (SIGNATURE)	DATE / TIME
[signature]	11/8/95 17:12				Suzette Brick	11/8/95 17:12

*MATRIX

WATER - W
SOIL / SEDIMENT - SO
OTHER - NA

DISTRIBUTION: ORIGINAL AND YELLOW COPIES ACCOMPANY SAMPLE SHIPMENT TO LABORATORY. PINK COPY RETAINED BY SAMPLERS. YELLOW COPY RETAINED BY LABORATORY.

REMARKS no ice, no seal temp = ambient, pH = n/a
Kevin S Bailey 11/8 17:15 | 6 containers

For Law Environmental National Lab Use Only

Are Custody Seals Present? Yes ☐ No ☒ Are Custody Seals Intact? Yes ☐ No ☐ N/A ☐ Inspected By: _____ Date: _____

LAW
ENGINEERING AND ENVIRONMENTAL SERVICES, INC.

January 22, 1996

Liz Booth
Law Engineering and Environmental Services, Inc.
112 TownPark Drive
Kennesaw, GA 30144

Subject: **Chemical analysis of samples received on 01/02/96**
Project Number: 55-3510 P003 T02

Dear Ms. Booth:

Law Environmental National Laboratories has completed its analysis of your samples and reports the results on the following pages. These results relate only to the contents of the samples as submitted. This report shall not be reproduced except in full without the approval of Law Environmental National Laboratories.

If there are any questions, please do not hesitate to contact Rhonda K. Arnwine at (770)-421-3306.

Sincerely,

LAW ENVIRONMENTAL NATIONAL LABORATORIES

Patrick Kelley for (01-22-96)

W. Paul Brafford
Laboratory Manager

WPB:pah

Enclosures: Data Report
Invoice

NATIONAL LABORATORIES
112 TOWNPARK DRIVE • KENNESAW, GEORGIA 30144
(770)421-3300 • FAX (770)421-3301
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LAW ENVIRONMENTAL NATIONAL LABORATORIES
TEST DATA REPORT

ate 01/22/96
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--- Project Information ---

Lab Number : 96-3329-01
Project No. : 55-3510 PHASE 003, T02 Cust. No. :
Project Name : CHATTAHOOCHEE STORM

Manager: LIZ BOOTH

--- Sample Information ---

Station ID : SUWANEE CK 1-4 Sampled Date/Time : 12/31/95 21:16
Matrix : W Received Date/Time : 01/02/96 14:20
Type : GRAB Received From/By : MES/CE
Collector : EAB Chain of Custody : 33439
Number of Containers : 3

arameter	Method	Units	DL	Results	Test Date	Analy
- INORGANIC CHEMISTRY RESULTS --						
iochemical Oxygen Demand (5-Day)	EPA 405.1	mg/l	2.0	4.6	01/02/96	SCC
hemical Oxygen Demand (Low)	EPA 410.4	mg/l	5.0	10	01/04/96	SCC
itrogen, Ammonia	EPA 350.1	mg/l	0.030	0.34	01/12/96	DF
itrogen, Nitrate-Nitrite	EPA 353.2	mg/l	0.050	0.54	01/15/96	DF
rtho Phosphate (as P)	EPA 365.1	mg/l	0.010	0.013	01/02/96	DF
H	EPA 150.1	units	2.0-13.0	7.3	01/02/96	DF
hosphorus, Total	EPA 365.1	mg/l	0.010	0.076	01/11/96	DF
esidue, Non Filterable (TSS)	EPA 160.2	mg/l	10	ND	01/05/96	SCC
otal Kjeldahl Nitrogen	EPA 351.2	mg/l	0.10	0.67	01/19/96	DF
urbidity	EPA 180.1	N.T.U	0.70	14	01/03/96	DCE

emarks:
DL = Detection Limit ND = Not Detected at the DL
Unless otherwise noted, all soil test results are calculated based on dry weight.

Signed Patrick Kelley

LAW ENVIRONMENTAL NATIONAL LABORATORIES
TEST DATA REPORT

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--- Project Information ---

Lab Number : 96-3329-02
Project No. : 55-3510 PHASE 003, T02 Cust. No. :
Project Name : CHATTAHOOCHEE STORM

Manager: LIZ BOOTH

--- Sample Information ---

Station ID : SUWANEE CK 5-8 Sampled Date/Time : 01/01/96 01:42
Matrix : W Received Date/Time : 01/02/96 14:20
Type : GRAB Received From/By : MES/CE
Collector : EAB Chain of Custody : 33439
Number of Containers : 3

rameter	Method	Units	DL	Results	Test Date	Analy
INORGANIC CHEMISTRY RESULTS --						
ochemical Oxygen Demand (5-Day)	EPA 405.1	mg/l	2.0	2.3	01/02/96	SCC
emical Oxygen Demand (Low)	EPA 410.4	mg/l	5.0	11	01/04/96	SCC
trogen, Ammonia	EPA 350.1	mg/l	0.030	0.21	01/12/96	DF
trogen, Nitrate-Nitrite	EPA 353.2	mg/l	0.050	0.50	01/15/96	DF
tho Phosphate (as P)	EPA 365.1	mg/l	0.010	0.015	01/02/96	DF
	EPA 150.1	units	2.0-13.0	7.3	01/02/96	DF
osphorus, Total	EPA 365.1	mg/l	0.010	0.085	01/11/96	DF
sidue, Non Filterable (TSS)	EPA 160.2	mg/l	10	ND	01/05/96	SCC
tal Kjeldahl Nitrogen	EPA 351.2	mg/l	0.10	0.62	01/19/96	DF
rbidity	EPA 180.1	N.T.U	0.70	16	01/03/96	DCE

marks:
DL = Detection Limit ND = Not Detected at the DL
Unless otherwise noted, all soil test results are calculated based on dry weight.

Signed Patrick Kelley

LAW ENVIRONMENTAL NATIONAL LABORATORIES
TEST DATA REPORT

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--- Project Information ---

Lab Number : 96-3329-03
Project No. : 55-3510 PHASE 003, T02 Cust. No. :
Project Name : CHATTAHOOCHEE STORM

Manager: LIZ BOOTH

--- Sample Information ---

Station ID : SUWANEE CK 9-12 Sampled Date/Time : 01/01/96 05:57
Matrix : W Received Date/Time : 01/02/96 14:20
Type : GRAB Received From/By : MES/CE
Collector : EAB Chain of Custody : 33439
Number of Containers : 3

rameter.....	Method....	Units	DL.....	Results...	Test Date	Analy
INORGANIC CHEMISTRY RESULTS --						
ochemical Oxygen Demand (5-Day)	EPA 405.1	mg/l	2.0	3.5	01/02/96	SCC
emical Oxygen Demand (Low)	EPA 410.4	mg/l	5.0	11	01/04/96	SCC
trogen, Ammonia	EPA 350.1	mg/l	0.030	0.38	01/12/96	DF
trogen, Nitrate-Nitrite	EPA 353.2	mg/l	0.050	0.53	01/15/96	DF
tho Phosphate (as P)	EPA 365.1	mg/l	0.010	0.016	01/02/96	DF
	EPA 150.1	units	2.0-13.0	7.3	01/02/96	DF
osphorus, Total	EPA 365.1	mg/l	0.010	0.096	01/11/96	DF
sidue, Non Filterable (TSS)	EPA 160.2	mg/l	10	13	01/05/96	SCC
tal Kjeldahl Nitrogen	EPA 351.2	mg/l	0.10	0.88	01/19/96	DF
rbidity	EPA 180.1	N.T.U	0.70	20	01/03/96	DCE

arks:
DL = Detection Limit ND = Not Detected at the DL
Unless otherwise noted, all soil test results are calculated based on dry weight.

Signed Patrick Kelley

LAW ENVIRONMENTAL NATIONAL LABORATORIES
TEST DATA REPORT

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--- Project Information ---

Lab Number : 96-3329-04
Project No. : 55-3510 PHASE 003, T02 Cust. No. :
Project Name : CHATTAHOOCHEE STORM

Manager: LIZ BOOTH

--- Sample Information ---

Station ID : SUWANEE CK 13-16 Sampled Date/Time : 01/01/96 09:57
Matrix : W Received Date/Time : 01/02/96 14:20
Type : GRAB Received From/By : MES/CE
Collector : EAB Chain of Custody : 33439
Number of Containers : 3

ameter.....	Method....	Units	DL.....	Results...	Test Date	Analy
INORGANIC CHEMISTRY RESULTS --						
chemical Oxygen Demand (5-Day)	EPA 405.1	mg/l	2.0	3.0	01/02/96	SCC
mical Oxygen Demand (Low)	EPA 410.4	mg/l	5.0	11	01/04/96	SCC
rogen, Ammonia	EPA 350.1	mg/l	0.030	0.42	01/12/96	DF
rogen, Nitrate-Nitrite	EPA 353.2	mg/l	0.050	0.52	01/15/96	DF
ho Phosphate (as P)	EPA 365.1	mg/l	0.010	0.015	01/02/96	DF
	EPA 150.1	units	2.0-13.0	7.3	01/02/96	DF
sphorus, Total	EPA 365.1	mg/l	0.010	0.11	01/11/96	DF
idue, Non Filterable (TSS)	EPA 160.2	mg/l	10	18	01/05/96	SCC
al Kjeldahl Nitrogen	EPA 351.2	mg/l	0.10	0.86	01/19/96	DF
bidity	EPA 180.1	N.T.U	0.70	22	01/03/96	DCE

arks:
DL = Detection Limit ND = Not Detected at the DL
Unless otherwise noted, all soil test results are calculated based on dry weight.

Signed Patricia Kelley

LAW ENVIRONMENTAL NATIONAL LABORATORIES
TEST DATA REPORT

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--- Project Information ---

Lab Number : 96-3329-05
Project No. : 55-3510 PHASE 003, T02 Cust. No. :
Project Name : CHATTAHOOCHEE STORM

Manager: LIZ BOOTH

--- Sample Information ---

Station ID : SUWANEE CK 17-20 Sampled Date/Time : 01/01/96 14:14
Matrix : W Received Date/Time : 01/02/96 14:20
Type : GRAB Received From/By : MES/CE
Collector : EAB Chain of Custody : 33439
Number of Containers : 3

rameter	Method	Units	DL	Results	Test Date	Analy
INORGANIC CHEMISTRY RESULTS --						
ochemical Oxygen Demand (5-Day)	EPA 405.1	mg/l	2.0	2.6	01/02/96	SCC
emical Oxygen Demand (Low)	EPA 410.4	mg/l	5.0	10	01/04/96	SCC
trogen, Ammonia	EPA 350.1	mg/l	0.030	0.32	01/12/96	DF
trogen, Nitrate-Nitrite	EPA 353.2	mg/l	0.050	0.53	01/15/96	DF
tho Phosphate (as P)	EPA 365.1	mg/l	0.010	0.014	01/12/96	DF
	EPA 150.1	units	2.0-13.0	7.3	01/12/96	DF
osphorus, Total	EPA 365.1	mg/l	0.010	0.089	01/11/96	DF
sidue, Non Filterable (TSS)	EPA 160.2	mg/l	10	ND	01/05/96	SCC
tal Kjeldahl Nitrogen	EPA 351.2	mg/l	0.10	0.63	01/19/96	DF
rbidity	EPA 180.1	N.T.U	0.70	18	01/03/96	DCE

marks:
DL = Detection Limit ND = Not Detected at the DL
Unless otherwise noted, all soil test results are calculated based on dry weight.

Signed Patricia Kelley

LAW ENVIRONMENTAL NATIONAL LABORATORIES
TEST DATA REPORT

ate 01/22/96
age 1

--- Project Information ---

Lab Number : 96-3329-06
Project No. : 55-3510 PHASE 003, T02 Cust. No. :
Project Name : CHATTAHOOCHEE STORM

Manager: LIZ BOOTH

--- Sample Information ---

Station ID : SUWANEE CK 21-24 Sampled Date/Time : 01/01/96 18:27
Matrix : W Received Date/Time : 01/02/96 14:20
Type : GRAB Received From/By : MES/CE
Collector : EAB Chain of Custody : 33439
Number of Containers : 3

arameter.....	Method....	Units	DL.....	Results...	Test Date	Analy
- INORGANIC CHEMISTRY RESULTS --						
iochemical Oxygen Demand (5-Day)	EPA 405.1	mg/l	2.0	2.2	01/02/96	SCC
hemical Oxygen Demand (Low)	EPA 410.4	mg/l	5.0	6.8	01/04/96	SCC
itrogen, Ammonia	EPA 350.1	mg/l	0.030	0.25	01/12/96	DF
itrogen, Nitrate-Nitrite	EPA 353.2	mg/l	0.050	0.50	01/15/96	DF
rtho Phosphate (as P)	EPA 365.1	mg/l	0.010	0.018	01/02/96	DF
H	EPA 150.1	units	2.0-13.0	7.3	01/02/96	DF
hosphorus, Total	EPA 365.1	mg/l	0.010	0.061	01/11/96	DF
esidue, Non Filterable (TSS)	EPA 160.2	mg/l	10	13	01/05/96	SCC
otal Kjeldahl Nitrogen	EPA 351.2	mg/l	0.10	0.59	01/19/96	DF
rbidity	EPA 180.1	N.T.U	0.70	20	01/03/96	DCE

emarks:
DL = Detection Limit ND = Not Detected at the DL
Unless otherwise noted, all soil test results are calculated based on dry weight.

Signed Patrick Kelley

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ANALYTICAL SERVICES, INC.

ENVIRONMENTAL MONITORING & LABORATORY ANALYSIS

110 TECHNOLOGY PARKWAY • NORCROSS, GA 30092
(770) 734-4200 • FAX (770) 734-4201

LABORATORY REPORT

Law Environmental - National Laboratory
112 Town Park Drive
Kennesaw, GA 30144

January 4, 1996

Attention: Ms. Elizabeth Booth

Report No. 68853

Sample: Water, grab, Chattahoochee, Project #55-3510, received 1/2/96

RESULTS

		Fecal Coliform (no/100ml) (SM 9222 D)
-1)	Suwanee Ck 1-4, 12/31/95, 21:16.....	3,500
-2)	Suwanee Ck 5-8, 1/1/96, 01:42.....	2,900
-3)	Suwanee Ck 9-12, 1/1/96, 05:57.....	3,600
-4)	Suwanee Ck 13-16, 1/1/96, 09:57.....	3,100
-5)	Suwanee Ck 17-20, 1/1/96, 14:14.....	2,800
-6)	Suwanee Ck 21-24, 1/1/96, 18:27.....	2,000
	Detection Limit	100

Respectfully submitted,

By: Rachel Fries